

2002年 2月27日 20時28分

NO. 2082 P. 39

FP01-0093-01US

claims.

WHAT IS CLAIMED IS:

1. An optical data link comprising:

a mounting member having a substrate with a plurality of holes, and a plurality of electrically conductive pins passing through said plurality of holes of said substrate;

5 a circuit board having a pair of surfaces with an electrically conductive layer connected to at least one pin of said plurality of electrically conductive pins, each of said pair of surfaces mounting an electronic component;

10 an optical element assembly, mounted on said mounting member, including a semiconductor optical element connected to said electrically conductive layer provided on said circuit board; and

15 means for supporting said circuit board so as to be spaced apart from said mounting member.

2. The optical data link according to claim 1, further comprising an electrically conductive cover, said cover covering said circuit board,

20 wherein said circuit board is provided such that one of said pair of surfaces thereof faces a main surface of said mounting member, and

wherein said mounting member has an electrically conductive film on said main surface of said mounting member.

25 3. The optical data link according to claim 1, wherein said mounting member has a hole for accommodating a part of said electronic component mounted on one of the surfaces

FP01-0093-01US

of said circuit board.

4. The optical data link according to claim 2, wherein said mounting member and said circuit board are arranged along a reference plane,

5 wherein said electrically conductive cover has a plurality of opening portions provided so as to communicate with space between said mounting member and said circuit board.

10 5. The optical data link according to claim 1, wherein said optical element assembly and said circuit board are supported by a support member mounted on said mounting member.

6. The optical data link according to claim 1, wherein said circuit board has a plurality of holes, said plurality of conductive pins being inserted into a plurality of holes.

15 7. The optical data link according to claim 2, wherein said mounting member has an insulating member provided along a surface of said mounting member, said surface of said mounting member being opposed to said main surface of said mounting member.

20 8. The optical data link according to claim 1, wherein said optical element assembly has a device mounting member, a terminal, a lens holding member, a lens, and a guide member, said device mounting member mounting said semiconductor optical element, said device mounting member holding said terminal, said lens holding member being provided on said device mounting member so as to cover said semiconductor

FP01-0093-01US

optical element, said lens being held by said lens holding member, and said guide member being provided on said lens holding member;

5 wherein said circuit board, said device mounting member, said semiconductor optical element, said lens holding member, said lens, and said guide member are arranged in the direction of a predetermined axis.

10 9. The optical data link according to claim 1, wherein said circuit board comprises an edge having a depressed portion, said optical element assembly being provided in said depressed portion.

15 10. The optical data link according to claim 1, wherein said circuit board comprises an edge having a depressed portion;

15 wherein said substrate of said mounting member comprises an edge having a depressed portion; and

wherein said optical element assembly is arranged in the depressed portions of said circuit board and substrate.

20 11. The optical data link according to claim 1, further comprising:

a semiconductor chip mounted on said circuit board; an electrically insulating protection member covering said semiconductor chip; and

25 a heat transfer part provided so as to contact said protection member and said optical element assembly.

wherein said means includes a supporting member

FP01-0093-01US

provided between said circuit board and said mounting member,
and

wherein said supporting member supports said circuit
board so as to separate said circuit board from said mounting
member.

5

12. The optical data link according to claim 1, further
comprising:

an electrically conductive cover covering said circuit
board;

10

a semiconductor chip mounted on said circuit board;

an electrically insulating protection member covering
said semiconductor chip; and

15 a heat transfer part provided so as to contact said
protection member, said optical element assembly, and said
electrically conductive cover;

wherein said semiconductor chip is provided between
said circuit board and said electrically conductive cover.

13. The optical data link according to claim 1, further
comprising:

20

an electrically conductive cover covering said circuit
board;

a semiconductor chip mounted on said circuit board;

an electrically insulating protection member covering
said semiconductor chip; and

25

a heat transfer part provided so as to contact said
protection member, said optical element assembly, and said

mounting member;

wherein said semiconductor chip is provided between said circuit board and said mounting member.

14. The optical data link according to claim 1, further
5 comprising:

an electrically conductive cover covering said circuit board;

a semiconductor chip mounted on said circuit board;

10 an electrically insulating protection member covering said semiconductor chip; and

a heat transfer part provided so as to contact said protection member, said optical element assembly, and said electrically conductive cover;

wherein said circuit board has a thermal via in an area
15 in which said semiconductor chip is mounted;

wherein said heat transfer part is provided so as to contact said thermal via;

16. said semiconductor chip is provided between said circuit board and said mounting member.

20 15. The optical data link according to claim 11, wherein said heat transfer part is provided so as to contact an electric conductor connected with said semiconductor chip.

16. The optical data link according to claim 11, wherein
25 said heat transfer part has electrical insulation preventing electrical conduction from occurring therethrough.

17. The optical data link according to claim 12, wherein

said heat transfer part exhibits flexibility to deform to conform to the shape of the protection member and optical element assembly when said heat transfer part is provided between said electrically conductive cover and said protection member and optical element assembly.

5

18. The optical data link according to claim 11, wherein said heat transfer part includes silicone ger material.

19. The optical data link according to claim 11, wherein said optical element assembly includes a semiconductor optical element, and

10

wherein said semiconductor chip comprises circuit elements for driving said semiconductor optical element.

15

20. The optical data link according to claim 11, said protection member includes one of a package and a resin, said package housing said semiconductor chip therein, and said resin being mounted on said circuit board so as to cover said semiconductor chip therewith.